

WHAT IS CLAIMED IS:

1. An exposure apparatus for exposing a wafer to a pattern, comprising:

5 a chamber that surrounds a predetermined space in the exposure apparatus;

an air-conditioner for adjusting an internal atmosphere of the exposure apparatus; and

a port section having a load-lock mechanism.

2. The apparatus according to claim 1, wherein said  
10 port section comprises an exhaust mechanism for exhausting gas from said port section, and a supply mechanism for supplying gas into said port section.

3. The apparatus according to claim 1, wherein said  
15 port section comprises a door for shielding said port section from outside of the exposure apparatus, and a door for shielding said port section from said chamber.

4. The apparatus according to claim 1, wherein said port section includes a plurality of port sections.

5. The apparatus according to claim 4, wherein said  
20 port section includes a first port section for loading the wafer and a second port section for unloading the wafer.

6. The apparatus according to claim 1, further comprising an interface for stocking a wafer between  
25 said port section and outside of the exposure apparatus.

7. The apparatus according to claim 6, wherein said interface comprises a load-lock mechanism.

8. The apparatus according to claim 6, wherein said interface is shared between a first port section for loading a wafer and a second port section for unloading the wafer.

5 9. The apparatus according to claim 6, wherein said interface is interposed between said port section and a coating/developing system.

10 10. The apparatus according to claim 1, wherein said port section comprises a temperature control mechanism for controlling a temperature of the wafer.

11. The apparatus according to claim 10, wherein the temperature control mechanism comprises a heater for heating the wafer.

15 12. The apparatus according to claim 11, wherein the heater heats the wafer.

13. The apparatus according to claim 12, wherein the wafer to be heated is a wafer coated with a resist.

14. The apparatus according to claim 11, wherein the heater heats an exposed wafer.

20 15. The apparatus according to claim 10, wherein the temperature control mechanism comprises a cooler for cooling the wafer.

16. The apparatus according to claim 15, wherein the cooler cools a heated wafer.

25 17. The apparatus according to claim 10, wherein the temperature control mechanism controls the temperature of the wafer while an internal atmosphere of said port

section is set close to an internal atmosphere of the exposure apparatus.

18. The apparatus according to claim 10, wherein the temperature control mechanism controls the temperature  
5 of the wafer while gas in said port section is exhausted.

19. The apparatus according to claim 18, wherein the wafer is heated while gas in said port section is exhausted.

10 20. The apparatus according to claim 18, wherein the wafer is cooled while gas is supplied to said port section.

21. The apparatus according to claim 1, further comprising a temperature controller incorporated in  
15 said chamber to control a temperature of the wafer.

22. The apparatus according to claim 1, further comprising another air-conditioner which is different from said air-conditioner and adjusts an ambient atmosphere of a temperature controller.

20 23. A wafer transfer method of transferring a wafer into an exposure apparatus, comprising the steps of:

transferring a wafer coated with a resist or anti-reflective agent to a port section having a load-lock mechanism;

25 heating the wafer transferred to the port section;

exhausting gas from the port section;

cooling the heated wafer;  
supplying gas to the port section; and  
transferring the wafer in the port section to the  
exposure apparatus.

5 24. The method according to claim 23, further  
comprising the step of controlling a temperature of the  
wafer transferred to the exposure apparatus by an  
internal temperature controller of the exposure  
apparatus.

10 25. A wafer processing method comprising the steps  
of:  
coating a wafer with a resist or anti-reflective  
agent;

heating the wafer; and  
15 exhausting an ambient atmosphere of the wafer  
before heating of the wafer ends.

26. The method according to claim 25, further  
comprising the step of supplying gas around the wafer  
after an ambient atmosphere of the wafer is exhausted.

20 27. The method according to claim 25, further  
comprising the step of cooling the heated wafer before  
the step of supplying gas around the wafer ends.

28. A coating/developing system having a resist  
coating unit for coating a wafer with a resist and a  
25 developing unit for developing the exposed wafer,  
comprising:

a door for shielding the coating/developing

system from a heating unit disposed outside the coating/developing system in order to pre-bake the wafer.

29. The system according to claim 28, further  
5 comprising a hand for unloading the wafer to the heating unit.

30. The system according to claim 29, further comprising a controller for controlling the hand.

31. The system according to claim 30, wherein said  
10 controller selects a plurality of external heating units and controls transfer of the wafer.

32. The system according to claim 30, further comprising another hand which is different from said hand and loads the wafer from a device outside the  
15 coating/developing system.

33. The system according to claim 32, wherein said hand for loading the wafer includes a hand for loading a heated wafer from an external device for heating an exposed wafer.

20 34. The system according to claim 28, further comprising a coating unit for an anti-reflective agent.

35. The system according to claim 34, wherein said coating unit applies the anti-reflective agent at least before or after resist coating.

25 36. A device manufacturing system comprising:  
a coating/developing system having a resist coating unit for coating a wafer with a resist and a

developing unit for developing the exposed wafer;

an exposure apparatus for exposing the wafer to a pattern of a master;

a port section which is interposed between said  
5 coating/developing system and said exposure apparatus  
and has a load-lock mechanism; and

a temperature control mechanism incorporated in  
said port section to control a temperature of the wafer.

37. The system according to claim 36, wherein said  
10 port section comprises an exhaust mechanism for  
exhausting gas from said port section, and a supply  
mechanism for supplying gas into said port section.

38. The system according to claim 36, wherein said  
temperature control mechanism heats the wafer.

39. The system according to claim 38, wherein the  
15 wafer to be heated is a wafer coated with a resist.

40. The system according to claim 36, further  
comprising a controller for controlling to heat while  
an internal atmosphere of said port section is set  
20 close to an internal atmosphere of said exposure  
apparatus after the wafer is transferred to said port  
section.

41. A device manufacturing method comprising the  
steps of:

25 installing manufacturing apparatuses for various  
processes of a device manufacturing system in a  
semiconductor manufacturing factory; and

manufacturing a semiconductor device by using the  
manufacturing apparatuses in a plurality of processes,  
the device manufacturing system having

a coating/developing system having a resist  
5 coating unit for coating a wafer with a resist and a  
developing unit for developing the exposed wafer,  
an exposure apparatus for exposing the wafer to a  
pattern of a master,

a port section which is interposed between the  
10 coating/developing system and the exposure apparatus  
and has a load-lock mechanism, and

a temperature control mechanism incorporated in  
the port section to control a temperature of the wafer.

42. The method according to claim 41, further  
15 comprising the steps of:

connecting the manufacturing apparatuses by a  
local area network; and

communicating information about at least one of  
the manufacturing apparatuses between the local area  
20 network and an external network outside the  
semiconductor manufacturing factory.

43. The method according to claim 41, wherein a  
database provided by a vendor or user of the exposure  
apparatus is accessed via the external network to  
25 obtain maintenance information of the manufacturing  
apparatus by data communication, or production  
management is performed by data communication between

the semiconductor manufacturing factory and another semiconductor manufacturing factory via the external network.

44. A semiconductor manufacturing factory comprising:

5 manufacturing apparatuses for various processes in a device manufacturing system;

a local area network for connecting said manufacturing apparatuses; and

10 a gateway which allows the local area network to access an external network outside the factory,

wherein information about at least one of said manufacturing apparatuses can be communicated, and

the device manufacturing system has

15 a coating/developing system having a resist coating unit for coating a wafer with a resist and a developing unit for developing the exposed wafer,

an exposure apparatus for exposing the wafer to a pattern of a master,

20 a port section which is interposed between the coating/developing system and the exposure apparatus and has a load-lock mechanism, and

a temperature control mechanism incorporated in the port section to control a temperature of the wafer.

45. A maintenance method for an exposure apparatus

25 installed in a semiconductor manufacturing factory, comprising the steps of:

causing a vendor or user of the exposure



apparatus to provide a maintenance database connected to an external network of the semiconductor manufacturing factory;

authorizing access from the semiconductor manufacturing factory to the maintenance database via the external network; and

transmitting maintenance information accumulated in the maintenance database to the semiconductor manufacturing factory via the external network,

10 the exposure apparatus having a chamber that surrounds a predetermined space in the exposure apparatus,

an air-conditioner for adjusting an internal atmosphere of the exposure apparatus, and

15 a port section having a load-lock mechanism.

46. An exposure apparatus for exposing a wafer to a pattern, comprising:

a chamber that surrounds a predetermined space in the exposure apparatus;

20 an air-conditioner for adjusting an internal atmosphere of the exposure apparatus;

a port section having a load-lock mechanism;

a display;

a network interface; and

25 a computer for executing network software,

wherein maintenance information of the exposure apparatus can be communicated via the computer network.

47. The apparatus according to claim 46, wherein the network software is connected to an external network of a factory where the exposure apparatus is installed, provides on said display a user interface for accessing  
5 a maintenance database provided by a vendor or user of the exposure apparatus, and enables obtaining information from the database via the external network.

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